

REMARKS/ARGUMENTS

Claims 1-2, 4-8, 13, 15-18 and 20-25 remain in the present application, of which claims 1, 13 and 20 are independent. Claims 1, 13, 20, 24 and 25 have been amended herein. No new matter has been introduced. Amendments to claims 1, 13, 20, 24 and 25 are supported by the specification and the drawings as filed, for example, in FIG. 2 and pages 5 and 6 of the specification. None of the claims is canceled herein. Applicants respectfully request reconsideration and allowance of claims 1-2, 4-8, 13, 15-18 and 20-25.

I. Claim Objections

Claim 1 and 24-25 were objected. As these claims have been amended as suggested by the Examiner, Applicants request that the objection to claims 1, 24 and 25 be withdrawn.

II. Rejection of Claims 20 and 25 Under 35 U.S.C. §103(a)

Claims 20 and 25

Independent claim 20 was rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Fleck et al. (U.S. Patent No. 6,434,689) in view of Roussakov (U.S. Patent No. 6,092,174). Claim 25 was rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Fleck et al. in view of Roussakov further in view of Higuchi et al.

Applicants respectfully traverse as follows.

Claim 20 now recites in relevant part, "the processing cells comprising non-periphery cells and periphery cells surrounding the non-periphery cells; communicatively connecting each of the non-periphery cells only to the processing cells that are immediately neighboring the non-periphery cell; and communicatively connecting the periphery cells to said processor by an interface module having a mechanism for reconfiguring a plurality of information paths between the interface module and respective said periphery cells." (emphasis added)

First, in rejecting claim 20, the Examiner appears to mis-apply "In re Japikse" as holding that "shifting the location of parts doesn't give patentability over prior art" in all cases.

According to MPEP 2144.04 (VI)(C), however, *In re Japiks* merely recites "Claims to a

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hydraulic power press which read on the prior art except with regard to the position of the starting switch were held unpatentable because shifting the position of the starting switch would not have modified the operation of the device." (emphasis added).

Applicants submit that *In re Japiks* is not applicable to claim 20 because of at least the following reasons. First, unlike in *In re Japiks*, neither Fleck et al. nor Roussakov would anticipate claim 20 regardless of the position of the reconfiguration mechanism. Secondly, the operation of the device in FIG. 3 of Roussakov would have to be modified if the elements 17 and 18 (which the Examiner appear to equate to the reconfiguration mechanism) were located in an "interface module." This is because the elements 17 and 18 are internal to each of the "processors", and removing these elements from the processors and incorporating them some place else would definitely have modified the operation of the device unlike mere shifting of the position of a switch.

Thirdly, MPEP 2144.02 also recites that "[t]he mere fact that a worker in the art could rearrange the parts of the reference device to meet the terms of the claims on appeal is not by itself sufficient to support a finding of obviousness. The prior art must provide a motivation or reason for the worker in the art, without the benefit of appellant's specification, to make the necessary changes in the reference device." *Ex parte Chicago Rawhide Mfg. Co.*, 223 USPQ 351, 353 (Bd. Pat. App. & Inter. 1984). Applicants submit that there is no such motivation or reason provided to combine the teachings of Fleck et al. and Roussakov to arrive at the claimed invention of claim 20.

The Examiner contends that "[i]t is obvious to one of ordinary skill in the art that the reconfiguration mechanisms can be moved to the network interface." Applicants respectfully traverse this because this statement appears to be a mere hindsight reconstruction, which is not permissible. In support of the argument, the Examiner asserts that "[o]ne of ordinary skill in the art would have been motivated by the lack of information by Fleck on FPGA's to add the functionality of Roussakov. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to implement the FPGA of Roussakov into the processor of Fleck . . ."

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However, as Roussakov does not even appear to disclose all features of claim 20 not found in Fleck et al., such as for example, "communicatively connecting each of the non-periphery cells only to the processing cells that are immediately neighboring the non-periphery cell," Applicants do not see how one skilled in the art would have been motivated or found any reason to combine Fleck and Roussakov to arrive at the claimed embodiment of claim 20.

In view of the above, Applicants request that the rejection of claim 20 be withdrawn and that this claim be allowed. Since claim 25 depends from claim 20, it incorporates all the terms and limitations of claim 20 in addition to other limitations, which together further patentably distinguish claims 25 over the cited references. By way of example, Higuchi et al. does not overcome the deficiency of Fleck et al. and Roussakov to reject claim 20; therefore, claim 25 would not have been obvious over Fleck et al., Higuchi et al. and Roussakov at the time when the invention was made. Therefore, Applicants request that the rejection of claim 25 be withdrawn and that this claim be allowed.

III. Rejection of Claims Under 35 U.S.C. §103(a)

Claims 1, 5-8, 13, 15-16 and 21-23

Claims 1, 5-8, 13, 15-16 and 21-23 were rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Higuchi et al. (U.S. Patent No. 5,822,605).

Applicants respectfully traverse as follows.

Independent claim 1 now recites:

A coprocessor coupled to a main processor having an execution speed greater than that of said processor, the coprocessor comprising a two-dimensional array of processing cells, including a plurality of periphery cells located on peripheral sides of the array; and

an interface module comprising:

a plurality of input/output (I/O) pads for the coprocessor,

a plurality of border cells disposed along an outside of the two-dimensional array and surrounding the two-dimensional array, each border cell being connected to a corresponding one of the periphery cells, each border cell including a buffer, and

a crossbar network for reconfigurably connecting each of the I/O pads to one of the border cells. (emphasis added)

In rejecting claim 1, the Examiner asserts "Higuchi disclosed a coprocessor . . . comprising a two-dimensional array of processing cells (Higuchi: Figure 1 element 100) (The processing elements make up a 2-d array.), including a plurality of periphery cells located on peripheral sides of the array (Higuchi: Figure 3 elements 30-32 and 303-305); and an interface module (Higuchi: Figure 1 elements 116 and 132-139), comprising: a plurality of input/output pads for the coprocessor (Higuchi: Figure 3 elements 30-32, column 14 lines 11-15)(Element 30 is an output pad for the processing element and elements 31-32 are input pads for the processing element. There are pluralities of these elements because elements 30-32 are replicated for each processing element." (emphasis added).

As recited above, the Examiner appears to construe elements 30-32 as both the periphery cells located at peripheral sides of the array and input pads for the processing element. Applicants respectfully submit that the elements 30-32 cannot be both the periphery cells and the input pads. Therefore, at least one element of claim 1 is missing from Higuchi et al. as construed by the Examiner.

Further, on page 6 of the Office Action, the Examiner appears to equate the element 305 of FIG. 3 of Higuchi et al. with "a plurality of border cells" in claim 1. However, the element 305 in FIG. 3 of Higuchi et al. appears to be merely an output port, and there is no indication that these output ports surround a two-dimensional array of processing cells. Therefore, Higuchi et al. as construed by the Examiner does not disclose at least one other element of claim 1.

To anticipate a claim, and to maintain a rejection based on 35 U.S.C. § 102, however, the reference must show every element or limitation of the claim in as complete detail as contained in the claim. *See, e.g., Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). Applicants submit that Higuchi et al. does not disclose, teach, or suggest at least some of the limitations of independent claim 1. Since Higuchi et al. does not disclose at least some of the limitations of claim 1, Higuchi et al. does not anticipate claim 1. Therefore, Applicants request that the rejection of claim 1 be withdrawn and that this claim be allowed.

Since claims 5-8 and 21-23 depend from claim 1, they each incorporate all the terms and limitations of claim 1 in addition to other limitations, which together further patentably distinguish these claims over the cited references.

By way of example, in rejecting claim 5, the Examiner asserts that "Official notice is given that the 2-D array can be configured to limit processing element message passing to the nearest neighbor elements. Thus it's obvious to one of ordinary skill in the art that processing element message passing is limited to the processing element's nearest neighbors." Applicants submits that this appears to be another impermissible hindsight reconstruction. Applicants respectfully request that the Examiner provide a proper reference to support the official notice or the rejection be withdrawn. Also, for any determination of obviousness, there must be at least an apparent reason why one skilled in the art would have modified the teachings of the cited reference to arrived at the claimed invention. Applicants submit that none was given in reference to claim 5.

In view of the above, Applicants request that the rejection of claims 5-8 and 21-23 be withdrawn and that these claims be allowed.

Independent claim 13 recites "[a] functional unit having a two-dimensional array of processing cells and being coupled to a main processor, the processing cells comprising non-periphery cells and periphery cells surrounding the non-periphery cells, the unit having a mechanism external to the two-dimensional array for reconfiguring a plurality of intra-processor information paths to the array to respective said periphery cells only."

In rejecting claim 13, the Examiner asserts on page 7 of the Office Action that "The crossbar control is external to the 2-D array and reconfigures the message paths through controlling the switches connecting processing elements" in reference to Higuchi et al., Figures 5-6 elements 504-507 and 705, column 15 lines 54-61 and column 16 lines 31-54.

However, according to Col. 15, lines 25-28, "FIG. 5 is a schematic circuit diagram showing the structure of the X-coordinate crossbar switch XB-X1. This XB structure is the same as that of the other XB-Xi (i = 2 or 3) or of the Y-coordinate crossbar switches XB-Yj (j = 0, 1 or 2)." (emphasis added). Therefore, it appears that the crossbar control controls message paths to

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all of the processing elements, and does not teach "reconfiguring a plurality of intra-processor information paths to the array to respective said periphery cells only." Therefore, Higuchi et al. does not disclose at least one limitation of claim 13, and does not anticipate claim 13. Therefore, Applicants request that the rejection of claim 13 be withdrawn and that this claim be allowed.

Since claims 15 and 16 depend from claim 13, they each incorporate all the terms and limitations of claim 13 in addition to other limitations, which together further patentably distinguish them over the cited references. Therefore, Applicants request that the rejection of claims 15 and 16 be withdrawn and that these claims be allowed.

Claims 2, 4 and 17-18

Claim 2 is rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Higuchi et al. further in view of Miyamori et al. ("REMARC: Reconfigurable multimedia array coprocessor").

Since claim 2 depends from claim 1, it incorporates all the terms and limitations of claim 1 in addition to other limitations, which together further patentably distinguish claim 2 over the cited references. Further, Miyamori et al. does not overcome the deficiency of Higuchi et al. to reject claim 1. Therefore, Applicants request that the rejection of claim 2 be withdrawn and that this claim be allowed.

Claims 4 and 17-18 are rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Higuchi further in view of Barat et al. ("Reconfigurable instruction set processor: An implementation platform for interactive multimedia applications").

Since claims 4 and 17-18 each depend from claim 1 or claim 13, they each incorporate all the terms and limitations of claim 1 or claim 13 in addition to other respective limitations, which together further patentably distinguish claims 4, 17 and 18 over the cited references. Further, Barat et al. does not overcome the deficiency of Higuchi et al. to reject claim 1 or claim 13. Therefore, Applicants request that the rejection of claims 4 and 17-18 be withdrawn and that these claims be allowed.

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IV. Concluding Remarks

In view of the foregoing amendments and remarks, Applicants earnestly solicit a timely issuance of a Notice of Allowance with claims 1-2, 4-8, 13, 15-18 and 20-25. If there are any remaining issues that can be addressed over the telephone, the Examiner is cordially invited to call Applicants' attorney at the number listed below.

Respectfully submitted,
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